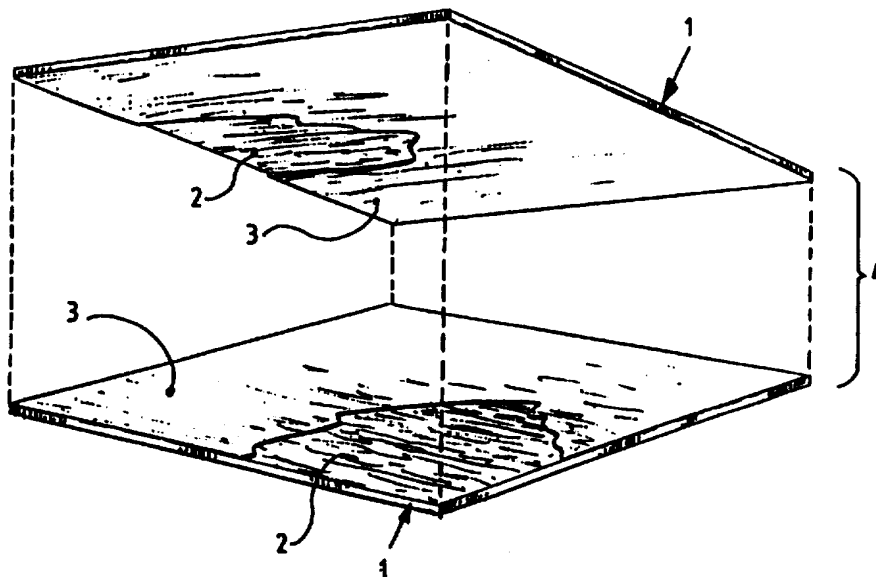




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(54) Title: METHOD FOR MANUFACTURING CARPET TILES AND CARPET TILE THUS MANUFACTURED



(57) Abstract

The invention relates to a method for manufacturing carpet tiles wherein each carpet tile is provided on its backing with an anti-slip layer extending over practically the whole tile and comprising an adhesive. After applying of the anti-slip layer the tiles can be adhered releasably to each other and then packed. The invention further relates to a carpet tile having on its backing an anti-slip layer as manufactured by this method. The anti-slip layer can comprise an adhesive which is chosen such that the adhesive power between the anti-slip layer and the backing of the tile is greater than between the anti-slip layer and a surface for covering with the tile. Finally, the invention also relates to a packaging filled with at least two such carpet tiles.

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**METHOD FOR MANUFACTURING CARPET TILES AND CARPET TILE
THUS MANUFACTURED**

The invention relates to a method for manufacturing carpet tiles, to carpet tiles manufactured with this method and to a packaging filled therewith. The invention relates more particularly to a method for manufacturing carpet tiles by providing each carpet tile on its backing side with an anti-slip layer comprising an adhesive. Such a method is known from EP-A-0 194 876.

Carpet tiles are generally known and are increasingly used as floor covering since in a great number of applications they offer great advantages compared with so-called broadloom carpet supplied on a roller. For instance, carpet tiles can be taken up easily to obtain access to spaces under a floor, e.g. a system floor, in order to lay or reposition electricity cables, computer cables and the like. Carpet tiles can moreover be removed locally in a room area without it being necessary to cease activities completely in this area, as would be the case with broadloom carpet. This is of particular importance for use in work areas. Also when carpet tiles are used, small portions of a floor covering can be replaced, which is important when the wear of the carpet is considerably greater at some locations than at others, for instance in parts of an office space walked on intensively or under desks. Replacement of carpet can thus take place in phases, depending on the intensity of use thereof. In addition, carpet tiles are lighter, easier to handle and simpler to transport than rolls of carpet, which is important in the case of use in high buildings. Finally, carpet tiles are simpler for DIY enthusiasts to work with.

A drawback of carpet tiles is that they tend to shift more quickly than a broadloom carpet fixed at its edges. There is moreover the danger with carpet tiles that when the floor is being cleaned using a powerful

vacuum cleaner they are unintentionally picked up due to the suction force. This problem occurs particularly in the case of the light-weight carpet tiles which have become popular in recent years. In order to obviate this drawback it has already been proposed to glue carpet tiles fixedly to the ground. However, a large part of the above stated advantages of carpet tiles, in particular the option of being able to take them up easily, is hereby lost. The arranging of carpet tiles also becomes relatively labour-intensive and therefore costly in this way.

It has also been proposed to adhere carpet tiles to the ground by means of a releasable adhesive layer, the adhesive power of which parallel to the ground is sufficient to prevent shifting of the carpet tile, while the adhesive power transversely of the ground is so small that the carpet tile can be released again with relatively little effort. Such an adhesive is made commercially available by for instance the Unipro company of Haaksbergen under the name "UZIN U 1000 L". This known solution has the drawback however that applying of the adhesive to the ground must take place carefully and that after application the adhesive must be dried for a period of time (about 10 to 15 minutes depending on the prevailing temperature and air humidity), since too rapid a drying would entail the danger of a permanent joint still resulting between the carpet tiles and the ground. The laying of the carpet tiles thus still becomes a time-consuming and costly operation.

In order to resolve the above stated problems a method for manufacturing carpet tiles is proposed in the said patent specification EP-A-0 194 876 wherein each carpet tile is provided on its backing side with an anti-slip layer comprising an adhesive. This anti-slip layer herein takes the form of a plurality of anti-slip blocks arranged in a specific pattern on the back of the tile. This pattern is so chosen herein that two carpet tiles can be placed with their backing against each other

without the adhesive anti-slip layers coming into mutual contact. As additional precaution, those portions of the backings where no anti-slip blocks are situated can be treated with a substance repelling the adhesive. By
5 applying the anti-slip layer to the carpet tile instead of on the ground and by already doing this during manufacture of the carpet tiles, laying of the carpet tiles is greatly simplified, while a good anti-slip of the carpet consisting of such tiles is still obtained. It is
10 moreover thus possible to suffice with a smaller amount of adhesive which, together with the tile, is ultimately burned or made suitable for re-use, thus minimizing the environmental impact.

The known method has the drawback however that
15 as a result of arranging the anti-slip layer in the form of separate blocks or "patches" of adhesive, the carpet tile has differing thicknesses locally, whereby the comfort and the appearance of a floor covering formed by such tiles are adversely affected. In addition, the
20 applying of an anti-slip layer to the tiles in a particular pattern is relatively laborious. Packing of the tiles such that the adhesive blocks remain free of each other is also complicated.

The invention therefore has for its object to
25 provide a method of the above described type wherein these problems do not occur. This is achieved according to the invention in that the backing of the carpet tile is covered practically wholly with the anti-slip layer. Applying of the adhesive anti-slip layer uniformly over
30 the whole surface of the carpet tile results in a tile of constant thickness with which a more comfortable and visibly flatter floor covering can be formed.

After applying of the anti-slip layer the tiles
35 are preferably adhered releasably to each other and subsequently packed, wherein the tiles are more preferably adhered to each other in pairs with their backing side. Surprisingly, it has been found here that even when two adhesive layers are placed in mutual

contact over the whole surface of the tiles, the tiles are still easily releasable again later. The tiles can thus be transported in efficient manner, wherein moreover a minimum of packaging material is required.

5 The invention also relates to a carpet tile manufactured according to the above described method. In a preferred embodiment of the invention the adhesive of the anti-slip layer of the carpet tile is chosen such that the adhesive power between the anti-slip layer and
10 the backing of the tile is greater than between the anti-slip layer and a surface for covering with the tile. Thus is ensured that, also after taking up, the anti-slip layer remains joined to the tile and does not remain behind on the ground. In a further preferred embodiment
15 of the invention the adhesive is chosen such that the adhesive power between the anti-slip layer and the ground is greater than the suction force of an industrial carpet cleaning apparatus. Thus is prevented that the tile, particularly a light-weight tile, is sucked loose of the
20 ground during cleaning operations. When the adhesive moreover exhibits flame-retarding or even flame-extinguishing properties, the fire safety of a floor covering formed by the tiles is increased. This is of particular importance when the tiles are used in high-rise build-
25 ings.

 Finally, the invention further relates to a packaging which is filled with at least two carpet tiles as described above. Herein the anti-slip layer preferably covers the backing of the tile practically completely and
30 the carpet tiles are releasably adhered to each other with the anti-slip layers on their backing.

 The invention is now elucidated on the basis of an embodiment, wherein reference is made to the annexed drawing, in which:

35 fig. 1 shows a schematic perspective view of a production line for performing the method according to the invention;

fig. 2 is a perspective view of the mutual adhering of the backings of a pair of carpet tiles; and
fig. 3 is a partly broken away perspective view of a packaging filled with carpet tiles.

5 In the method for forming carpet tiles 1 according to the present invention, light-weight material for the backing 2 wound onto a roll 6 (fig. 1) is first guided along a gluing station 14 where glue 8 runs in
10 evenly spread manner from an outlet opening 11 of a container 10. The backing provided with a glue layer 8 is then guided to a pressing station 15. In pressing station 15 the backing 2 covered with glue 8 is combined with a
15 top layer 12 coming from a roll 7. The top layer 12 and the backing 2 covered with glue are pressed onto one another by pressure rollers 9 of the pressing station 15 to form a carpet 13.

After optionally also being guided along a drying installation (not shown), the thus formed carpet 13 is transported to a coating station 16 where the
20 backing 2 of carpet 13 is coated with an anti-slip layer. This coating station 16 comprises a container 17 filled with a material 18 which will form the anti-slip layer. A transfer roller 19 is arranged rotatably in the container 17 and placed such that it is partially immersed in the
25 liquid material 18 and with its upper part just makes contact with carpet 13. By rotating roller 13 the anti-slip material 18 is applied over the full width of the backing 2 of carpet 13. The thus coated carpet is deflected by a guide roller 20 to a drying station 21 where
30 a plurality of infrared radiators dry the anti-slip material 18 applied to the backing 2.

Via a guide roller 23 the carpet with the dried anti-slip layer comes to a first cutting station 24 where
35 a number of parallel circular blades 26 arranged rotatably at equal distances on a shaft 25 cut the carpet into strips. In a second cutting station 27 the carpet strips are cut to carpet tiles 1 by a vertically displaceable punching blade arranged in a frame 28. At a pack-

ing station 30 these carpet tiles 1 are then placed in pairs in a packaging 5 (fig. 3) with their anti-slip layers 3 mutually facing. Because the anti-slip layer 3 covers the whole backing of the tiles 1 it is not necessary here to place the tiles against each other in a specific manner, as was usual with the above discussed tiles according to the prior art.

The packaged tiles 1 eventually reach an end user who takes the tiles 1 out of the packaging 5 and can place them on a surface where due to the anti-slip layer 3 arranged thereon the tiles 1 form a robust carpet. Because the anti-slip layer 3 is arranged on the tiles and does not have to be applied to the ground prior to laying of the tiles 1, the tiles can be laid simply and quickly.

Used as anti-slip layer 3 in the embodiment shown is an adhesive which adheres more strongly to the material of the backing 2 of carpet tile 1 than to most other materials, such as for instance the material of the ground on which the tile 1 must be arranged or the material of the top layer 12 of the tile. Such an adhesive layer 3 adheres sufficiently to the ground to prevent shifting of the tile 1, but the adhesive power is not so strong that release of the tile 1 is made more difficult thereby. The adhesive is however chosen such that the adhesive power is greater than the suction force generated by modern high-power industrial carpet cleaning machines, so that the tile is not accidentally sucked up during cleaning of the floor covering. The adhesive layer moreover remains adhered to the backing 2 of tile 1 when it is taken up so that the ground does not thereafter have to be cleaned separately or provided with a new top layer. Taking up of the tiles, for instance when a rented area must be surrendered empty, is thus speeded up and finishing work minimized. Moreover, the adhesive together with the carpet tiles can thus be made suitable in simple manner for re-use, or burned. The environmental impact is

thus minimal. A suitable adhesive is for instance the above mentioned UZIN U 1000 L.

When the carpet tile according to the invention is intended for use in buildings where the fire safety is of particular importance, for instance in high-rise buildings, an adhesive can advantageously be applied which exhibits flame-retarding or even flame-extinguishing properties. The tile hereby fulfills a dual function, serving not only as floor covering but also as fire-resistant material.

Because the adhesive layer 3 adheres more strongly to the backing 2 than to any other type of material, including the top layer 12, the tiles 1 can for transport purposes be simply stacked on one another and placed in a packaging. However, in order to avoid any risk of adhering of the adhesive layer 3 to the top layer 12 of the tile, the tiles are preferably adhered in pairs to one another with their backing to form a unit 4 (fig. 2) and these tile units 4 are then packed (fig. 2 and 3). Any danger of damage to the tiles 1 by the adhesive layer 3 is thus prevented without it being necessary for this purpose to provide each tile 1 with a protective foil for removal before use or to arrange insert sheets and the like in the stacks of tiles. This enables a considerable saving in the amount of packaging material used, which results in cost reduction and less of an environmental impact. It is moreover only necessary for the tiles to be taken apart prior to use, whereby laying of tiles 1 also costs less time than is the case with the use of such protective packaging layers.

CLAIMS

1. Method for manufacturing carpet tiles by providing each carpet tile on its backing with an anti-slip layer which comprises an adhesive, **characterized in that** the backing of the carpet tile is covered
5 practically completely with the anti-slip layer.

2. Method as claimed in claim 1, **characterized in that** after applying of the anti-slip layer the tiles are adhered releasably to each other and subsequently packed.

10 3. Method as claimed in claim 2, **characterized in that** the tiles are adhered in pairs to each other with their backing side.

4. Method as claimed in any of the foregoing claims, **characterized in that** the adhesive is dried prior
15 to packaging of the tiles.

5. Method as claimed in any of the foregoing claims, **characterized in that** the tiles are cut from a roll of carpet and the anti-slip layer is applied to the roll before cutting thereof.

20 6. Carpet tile having on its backing an anti-slip layer which comprises an adhesive, evidently manufactured by the method as claimed in any of the foregoing claims.

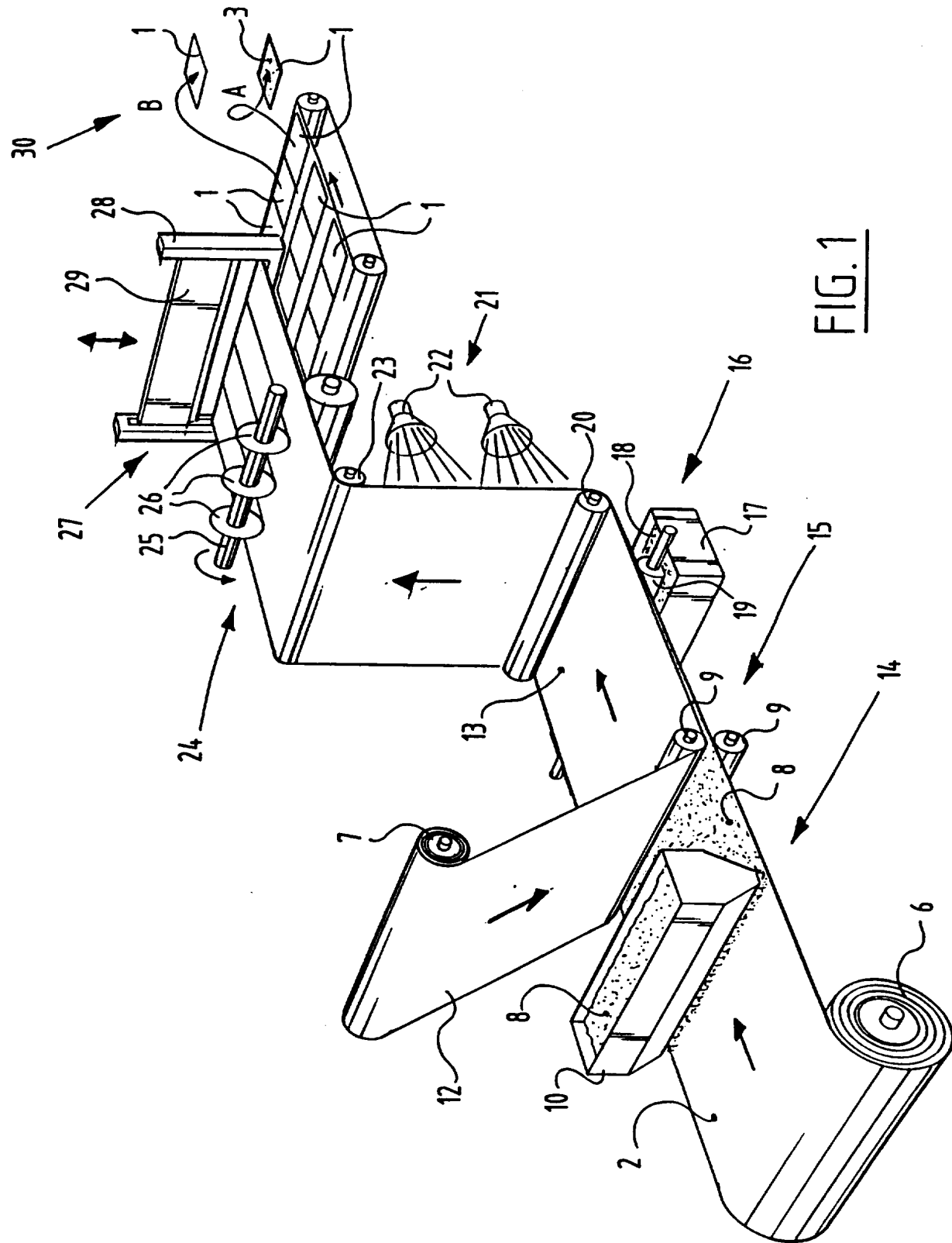
7. Carpet tile as claimed in claim 6,
25 **characterized in that** the adhesive is chosen such that the adhesive power between the anti-slip layer and the backing of the tile is greater than between the anti-slip layer and a surface for covering with the tile.

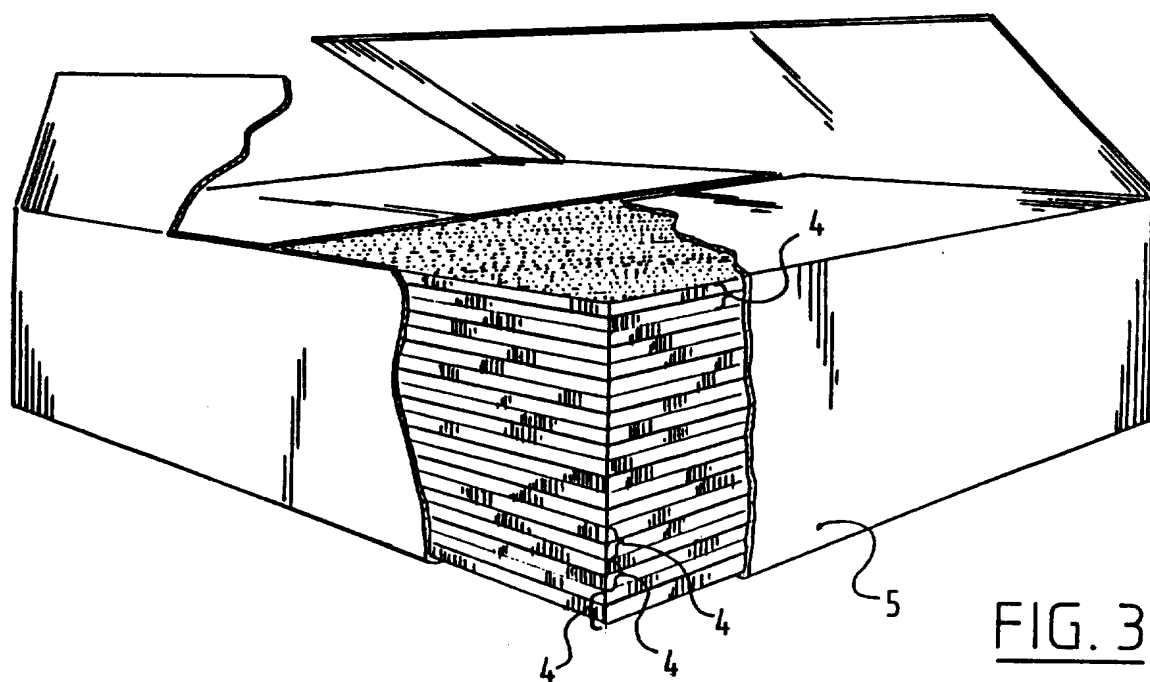
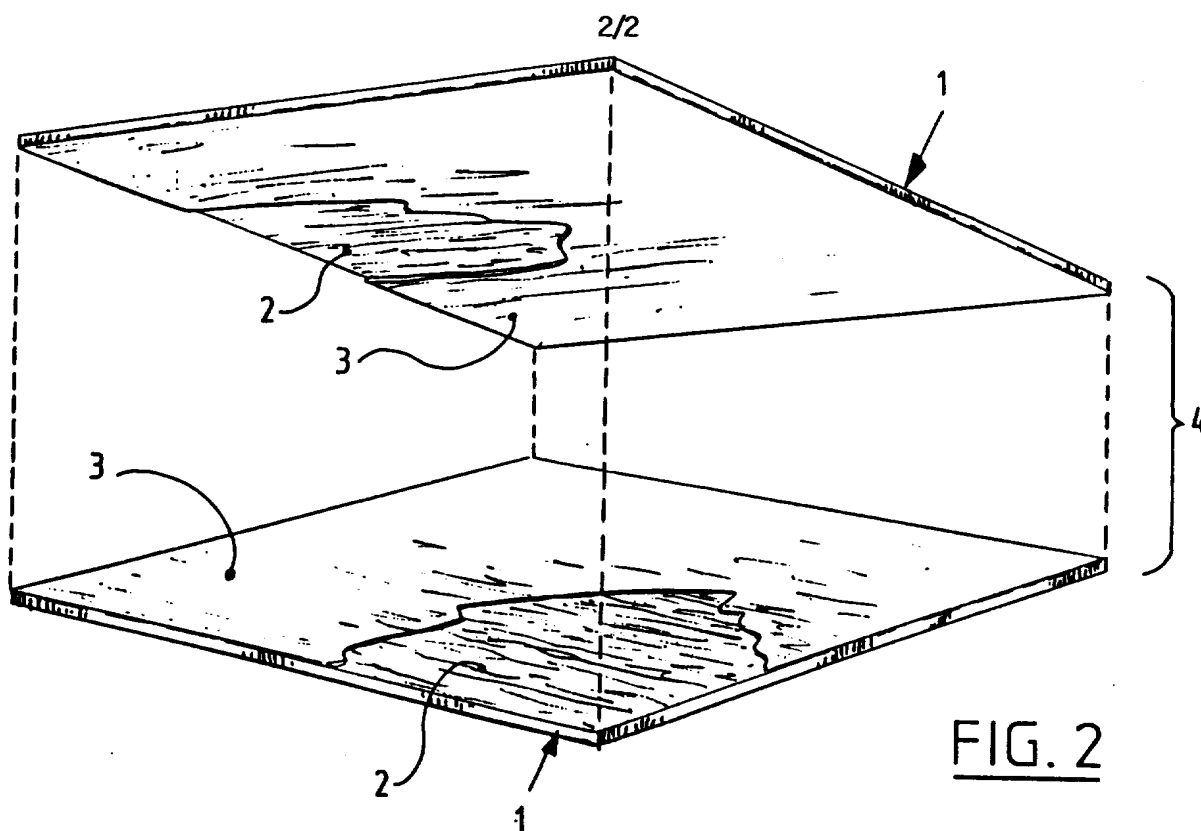
8. Carpet tile as claimed in claim 6 or 7,
30 **characterized in that** the adhesive is chosen such that the adhesive power between the anti-slip layer and the surface is greater than the suction force of an industrial carpet cleaning apparatus.

9. Carpet tile as claimed in any of the claims 6-8, **characterized in that** the adhesive exhibits flame-retarding or flame-extinguishing properties.

5 10. Packaging filled with at least two carpet tiles as claimed in any of the claims 6-9.

10 11. Packaging as claimed in claim 10, **characterized in that** the anti-slip layer covers the backing of the tile practically completely and the carpet tiles with the anti-slip layer are releasably adhered to each other on their backings.





INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 95/00297

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 D06N7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 D06N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO,A,83 04170 (KUNSTSTOFFVERWERTUNG AG) 8 December 1983 see page 1, line 1 - page 5, line 7 ---	1,2,7
A	EP,A,0 194 876 (BURLINGTON INDUSTRIES INC) 17 September 1986 see page 1, line 23 - page 8, line 2 ---	1-7,10, 11
A	GB,A,2 076 336 (NIPPON OIL CO LTD) 2 December 1981 see page 1, line 25 - page 3, line 40; claim 1 -----	1,6

☐ Further documents are listed in the continuation of box C.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
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